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EXHIBIT A

SUMMARY OF FACTUAL BASIS FOR LIABILITY OF W.R. GRACE, THE MBTA AND THEIR CONTRACTORS FOR CONTAMINATION AT THE RUSSELL FIELD PROPERTY¹

I. W.R. GRACE PROPERTY AND OPERATIONS²

The W.R. Grace property consists of an irregularly shaped 27-acre parcel that borders Whittemore Avenue and One Alewife Center (which was previously owned by W.R. Grace and/or its predecessors) to the north, the Russell Field Property to the east and south, Rindge Avenue to the south, surrounds the MBTA Alewife T Red Line Head house, and is bounded by Alewife Brook Parkway to the west. The northern end of the W.R. Grace property contains two large, multiple-story, brick and concrete buildings that have a combined footprint of approximately 176,000-square-feet (ft.) along with landscaped areas, and an asphalt-paved parking area. The remainder of the W.R. Grace property consists of open, grassy areas, areas of overgrown vegetation surrounded by 8-foot (ft.) chain-link fencing, public-access walkways, and Jerry's Pond, which is located on the southern end of the parcel. Two bioremediation beds are located on the Grace property within a fenced area between the Alewife Red Line Head House and the Russell Field Property.

W.R. Grace and its predecessors (Dewey & Almy Chemical Company) used the property for industrial and/or commercial purposes since at least the early 1900's. On information and belief, Dewey & Almy was founded in 1919 for the manufacture of rubber products. In 1954, Dewey & Almy merged with W.R. Grace & Co., to become the Dewey & Almy Chemical Division of W.R. Grace & Co. It is believed that asbestos was handled in two on-site buildings in the early 1930s as part of a brake lining development program. Asbestos-related activities also occurred on site in the late 1960s and early 1970s when a laboratory analysis and research program was conducted for asbestos-containing fireproofing materials. The above referenced buildings were constructed in 1929 and used for warehousing, experimental process development, and the manufacture of solvent-based jar sealing compound, air-entraining agents for concrete, a silicone masonry sealant, and a dispersant. One of the major products

¹ Russell Field is a City-owned recreational facility located on and in the vicinity of Rindge Avenue, Alewife Brook Parkway, Harvey Street and Clifton Street (referred to hereinafter as the "Russell Field Property"). The Russell Field Property is bordered to the north and west by property owned by W.R. Grace, to the south by Rindge Avenue and a Metropolitan District Commission (MDC) swimming pool, and to the east by Clifton Street residences.

² Much of the following information related to W.R. Grace's property and operations was most recently set forth in the "Removal Program Preliminary Assessment/Site Investigation Report" prepared for the U.S. EPA by Roy F. Weston, Inc., Region I, Superfund Technical Assessment and Response Team 2000, dated February 2001 (EPA00003-EPA00067). The Bates Numbered documents referenced in this exhibit have been made available to the parties by the City of Cambridge, with the exception of the Bates Numbered documents attached hereto as Exhibits B and E.

manufactured on site was naphthalene sulfonate, which is a compound used to facilitate the dispersion of rubber in water.

During the period of naphthalene sulfonate manufacture, on-site lagoons were used as settling ponds and as sources of cooling water. It appears that those lagoons were used for disposal of those and/or other process wastes through the early 1980's (see February 4, 1980 Letter from W.R. Grace to Massachusetts DEQE at CCC02050-CCC02059). From 1946 to 1961, one of the buildings housed chemical tank churns. From 1979 to 1984, the building was used for various chemical manufacturing processes. It is reported that acetone was used on site as a raw material by W.R. Grace. Hazardous substances identified at elevated levels in soils and/or groundwater at the Grace property include, among others, asbestos, naphthalene, polycyclic aromatic hydrocarbons (PAHs) and metals. Reported asbestos concentrations ranged up to 12 percent in subsurface soils.

A diagram prepared by Haley & Aldrich ("H&A"), W.R. Grace's environmental consultant, entitled "Site Conditions During Dewey & Almy Operations - Storage Areas," depicts several areas in which various chemical compounds were stored in aboveground storage tanks (ASTs) and underground storage tanks (USTs) on the property. According to the diagram, these chemical compounds included: acetone, toluene, methanol, "white oil," latex, zinc, chloride, ammonia, rosin, propane, diesel fuel, gasoline, light oil, heavy fuel oil, calcium lignosulfate, soap, fatty acid, muriatic acid, alcohol, vinyl acetate, nitrogen, sodium hydroxide, potassium hydroxide, sulphuric acid, naphthalene, and formaldehyde. The H&A diagram also indicates that a tank farm located on the property contained ASTs that held, at various times, styrene, butadiene, methyl acetate, dibutyl maleate, isobutyl ether, and hexylene glycol.

The release of oil and hazardous materials to soils and groundwater at W.R. Grace's property was confirmed during the subsurface investigations conducted on the property in the 1970's in anticipation of the MBTA's Red Line Extension project (described below). Numerous investigations of the Grace property since then have confirmed the release of oil and hazardous materials on and in the vicinity of the Grace property, including among others the release of asbestos, naphthalene, PAHs and metals (the contaminants of concern at the Russell Field Property) (see, e.g., Haley & Aldrich Figure entitled "Naphthalene And Other Polynuclear Aromatic Hydrocarbon Concentrations In Groundwater And Surface Water" [on the W.R. Grace property] at CCC01997).

On information and belief, oil and hazardous materials generated by W.R. Grace have been released to soil and groundwater at the Russell Field Property as a result of direct releases from W.R. Grace's operations, migration through soils and/or groundwater, and/or surface water runoff. See, for example, the following:

1. December 6, 1979 report prepared by H&A on behalf of W.R. Grace entitled "Summary of Investigations and Conclusions" (CCC02054-CCC02059), identifying areas on the WR Grace property where approximately 8,600 cubic

yards of "process wastes" were disposed, identifying the source of groundwater contamination in the vicinity of W.R. Grace's property as being the settling pond and "waste disposal pit" and possibly the "wash lagoon," and concluding that vertical and horizontal contamination migration "is apparent" and that "the settling pond must be reconstructed to eliminate apparent leakage" and "[t]he wash lagoon should be eliminated or lined to prevent leakage" (CCC02055).

2. February 14, 1979 to February 23, 1979 correspondence between W.R. Grace, the Massachusetts DEQE, and City of Cambridge at CDD03923-CDD03932 regarding "an unfortunate failure of a piece of equipment in our [W.R. Grace] Cambridge facility caus[ing] a temporary reduction in the effectiveness of our stack scrubber system ... connected to deposits of powder on the ground in the athletic field and adjacent neighborhood ... [containing] DAXAD 17 ... the sodium salt of polymerized alkyl naphthalene sulfonate."

In addition, on information and belief, oil and hazardous materials from W.R. Grace's property and operations were actively transported to, stored on and released into soils at the Russell Field Property during the construction of the MBTA's Red Line Extension, as a result of activities conducted by W.R. Grace, the MBTA and their contractors during that project, as described below.

II. OVERVIEW OF USE OF THE RUSSELL FIELD PROPERTY BY W.R. GRACE, THE MBTA AND THEIR CONTRACTORS DURING THE RED LINE EXTENSION

The MBTA's Red Line Extension was designed to pass through the northern section of the Russell Field Property and a portion of W.R. Grace's property, including "an area which has been used for many years by W.R. Grace & Company for the disposal of sludge containing organic compounds" (see Notice of Intent filed for sludge solidification project at CCC00004; November 7, 1979 Notice of Intent for the Red Line Extension construction activities, including the staging of excavated materials on the Russell Field Property, at CDD00210-CDD00226; Location Plan for MBTA Red Line Extension at CCC03540). One aspect of the Red Line Extension project was the use of the Russell Field Property by the MBTA and its contractors for staging materials excavated from the W.R. Grace property to be subsequently used as backfill over the completed tunnel.

The MBTA's use of the Russell Field Property was subject to an Agreement between the MBTA and the City entered into an Agreement dated June 2, 1978 (DPW00447-DPW00455), which provided, among other things, as follows:

"The [MBTA] shall have the right, for a period of five years ... to occupy Russell Field ... for the purpose of construction staging i.e. construction equipment, mills, laydown, storage, backfill, and construction personnel...."

* * *

“The [MBTA] shall remove all construction staging related equipment and material from Russell Field upon the earlier to occur of five (5) years of the date hereof or completion of construction ... and shall forthwith have the property reconstructed for open space in a manner agreeable to the City. A plan for the reconstruction of Russell Field shall be submitted to the City by the Authority, and reconstruction of Russell Field shall not commence until said plan has been approved by the City. The existing loam on Russell Field may be stripped by the Authority prior to its use of Russell Field. The loam may be stored and then replaced after use. In any event, the Authority shall upon the termination of this agreement deliver Russell Field covered with the same amount of loam as now exists.”

* * *

“The Authority shall hold harmless and indemnify the City and its employees for any amounts paid by the City as compensation for property or other damage or personal injury for which the Authority is responsible in connection with its occupancy of Russell Field . . . or which is based in any way on the Authority’s project of extending its Red Line through the City.”

The Red Line Extension construction activities and the use of the Russell Field Property for storage of backfill was also subject to a Superseding Order of Conditions issued by the Massachusetts DEQE on or around March 28, 1980, File #123-19 (CCC02476-CCC02479), as extended on April 23, 1982 and subsequently amended (to allow the MBTA to raise the elevation of the Russell Field Property during its restoration).

III. SLUDGE SOLIDIFICATION PROCESS

To address the most contaminated areas of the W.R. Grace property in the vicinity of the proposed Red Line Extension, W.R. Grace, the MBTA and their contractors jointly designed and conducted a process to excavate and solidify what was believed to be the most contaminated sludge on the Grace property, including sludge from the process sludge waste disposal areas adjacent to the Russell Field Property (see 1980 Figure prepared by Godberg, Zoino, Dunnicliff & Associates entitled “Monitoring Well Location Plan” at CCC00562 and Memorandum from Cambridge Conservation Commission dated July 15, 1983 regarding “Description of the Conservation Commission’s involvement with the W.R. Grace site and Russell Field” at CCC00666-CCC00668). The sludge contained naphthalene and naphthalene constituents, as well as PAHs and other hazardous materials, as documented by the MBTA’s consultant, Goldberg, Zoino Associates, and W.R. Grace’s consultant, Haley & Aldrich (see.e.g., July 15, 1983 Memorandum at CCC00667 and Status Report on the Monitoring Program for Groundwater Quality in the Sludge Solidification Area, prepared by Sverdrup for the MBTA, at DPW00402-

DPW00434). The sludge solidification process was implemented pursuant to an Order of Conditions issued by the Cambridge Conservation Commission in October 1, 1980, File #123-24 (CCC0047-CCC0050), as extended on October 5, 1982 (CCC00428) and subsequently amended (CCC00413-CCC00420).

As described in the Notice of Intent filed by the MBTA for the sludge solidification activities dated August 29, 1980 (CCC00003-CCC00030), the sludge solidification process involved four steps. First, the sludge was excavated and loaded into a "charging area." Second, the sludge was loaded into a "mixing area," where the "chemicals" and "contaminated groundwater" were blended in with the sludge to achieve solidification. Third, "the treated sludge, still in liquid form," was transported to a deposit area, adjacent to the Russell Field Property, formed by unlined, earth berms. Fourth, the solidified sludge was stockpiled and stored until such time as it could be "either (1) removed from the site or (2) graded on the existing site." A plan dated August, 1980 depicts the various process areas and their proximity to the Russell Field Property (CCC00030; see also Exhibit E to this package of materials and Haley & Aldrich Figure VI-9 entitled "Waste Storage Areas During Sludge Solidification By The MBTA" at CDD00315). No liners or other structures, other than earth berms, were proposed to prevent the spreading or migration of hazardous materials onto the Russell Field Property.

On information and belief, during the sludge solidification process, excavated untreated contaminated sludge was loaded onto an unlined area abutting and/or directly on the Russell Field Property prior to be loaded into the "charging area" (see Exhibit E to this package of materials) – an area which has now been confirmed to correlate directly with a contamination "hot spot" on the Russell Field property (See Figures included in Exhibit F to this package of materials). In addition, one of the solidified sludge stockpiling locations was directly on the Russell Field Property – again correlating directly with a contamination "hot spot" on the Russell Field property (see Exhibit E and the Figures included in Exhibit F to this package of materials). Two other solidified sludge stockpiling areas were immediately adjacent to the Russell Field Property (see Exhibit E to this package of materials and Haley & Aldrich Figure VI-9 entitled "Waste Storage Areas During Sludge Solidification By The MBTA" at CDD00315 and the April 20, 1982 report referencing stockpiled sludge on the Russell Field Property at DEP01728).

During the implementation of the sludge solidification process, more contaminated sludge was processed than had been anticipated (see, e.g., June 15, 1982 Letter from Perini to the MBTA at CDD00123-124). In addition, while the sludge was initially intended to be stockpiled on and near the Russell Field Property for only a brief period, it was ultimately stockpiled for several months (id.).³

³ The MBTA had contracted with Perini to dispose of the solidified sludge. The June 15, 1982 letter from Perini to the MBTA states that 14,880 cubic yards were excavated from November 2, 1981 to December 1, 1981 and that the sludge was not removed until April 3, 1982. Perini also states that the site where the sludge was to be disposed of had closed for the winter, which "in turn lead to a shutdown of operations in the area of the Solidified Sludge piles." (CDD00123-124; see also CDD00128-129).

In implementing the sludge solidification process, W.R. Grace, the MBTA and their contractors also failed to comply with several requirements of the Order of Conditions governing the work, including the performance of a monitoring program. See, for example, the following:

1. March 1983 letter from Cambridge Conservation Commission to MBTA, notifying the MBTA that it had failed to satisfy groundwater monitoring obligations of the applicable Order of Conditions approving the sludge solidification program (CCC00053), stating as follows:

“To date the MBTA has failed to provide any results of testing, as requested, nor have any reasons been given for not carrying out the monitoring plan. The failure to provide the date requested is a violation of the Orders of Condition.”
2. July 15, 1983 Memorandum from Cambridge Conservation Commission regarding “Description of the Conservation Commission’s involvement with the W.R. Grace site and Russell Field” (CCC00666-CCC00668).
3. August 5, 1983 Letter from Cambridge Conservation Commission to Massachusetts DEQE, describing the MBTA’s failure to implement the groundwater monitoring program required by the Commission’s Order of Conditions, the issuance of an Amended Order of Conditions to include a new groundwater monitoring program (including testing for napthalene), and the MBTA’s “wish to scale back [the monitoring program] due to costs they did not anticipate” (CCC02222).
4. February 17, 1988 Letter from Cambridge Conservation Commission to the MBTA stating that the MBTA had failed to satisfy conditions 21-28 of the July, 1983 Amended Order of Conditions related to the sludge solidification program (CCC01884-CCC01892).

The sludge excavation staging areas, disposal areas and solidified sludge stockpiling areas correlate directly with contamination hot spots on the Russell Field Property that are expected to require remediation. (See Exhibits E and F to this package of materials). On information and belief, the activities of W.R. Grace and its contractors, the MBTA and its contractors, including Sverdrup and Perini, in connection with the sludge solidification process resulted in the release of oil and hazardous materials at the Russell Field Property.

IV. USE AND OPERATION OF THE RUSSELL FIELD PROPERTY BY MBTA AND ITS CONTRACTORS AS A STAGING AREA FOR EXCAVATED MATERIALS

From commencement of the Red Line Extension construction work in 1980 until the Russell Field Property’s reconstruction in 1986, the MBTA and its contractors utilized the

Russell Field Property as a staging area for, among other things, contaminated soils excavated from the W.R. Grace property. The soils were initially intended to be temporarily staged on the Russell Field Property and subsequently used as backfill over the completed tunnel. The MBTA, Sverdrup, Perini and White/Morrison/Mergentime had joint operational control over the excavation, staging, backfilling and other activities conducted on the Russell Field Property during this period (see, e.g., November 6, 1981 Letter from Perini to MBTA at CDD00024-CDD00025 reflecting the joint activities of MBTA, White/Morrison/Mergentime and Perini on the Russell Field Property).

The MBTA and its contractors knew that the soils that they brought onto and managed on the Russell Field Property contained oil and/or other hazardous materials, including but not limited to naphthalene and PAHs (see, e.g., September 27, 1983 Letter from MBTA to Cambridge Conservation Commission at CCC00108-CCC00116, stating that "Of the disturbed soils containing naphthalene, a portion has been used as backfill for the Red Line Tunnel and a portion is stockpiled at Russell Field").⁴ Attached to a June 14, 1983 Letter from the DEQE to the Somerville Health Department is a "Memorandum of the Record" regarding complaints of odors associated with the soils being staged at the Russell Field Property and used as backfill (CDD00296-CDD00298). The Memorandum states that the odor problems were associated with soil being used to backfill a portion of the tunnel near Davis Square, originating from stockpiled soils at the Russell Field Property. It also states as follows:

"The stockpiled fill had originally been excavated during tunnel construction adjacent to WR Grace and Company. The fill, predominantly clay, was mixed with sandy soil to improve its handling characteristics and stockpiled for future use as tunnel backfill."

Despite such knowledge, the MBTA and its contractors failed to comply with the requirements of the DEQE's Superseding Order of Conditions governing their soil management activities or to otherwise take appropriate measures to manage the contaminated soils being handled by them on the Russell Field Property to prevent their dispersal across the site and the release of oil and/or hazardous materials into the soils and groundwater at the site from such staged materials. Among other violations of the Superseding Order of Conditions, backfill was stored in areas outside of the designated backfill storage areas, backfill was not covered or seeded as required to prevent erosion and dispersion, and heavy equipment was utilized on the Russell Field Property by the MBTA and its contractors causing the tracking of backfill materials across the Russell Field Property and, on information and belief, the release of oil and hazardous materials into soils at the Russell Field Property. See, for example, the following documents:

⁴ See also, November 1, 1982 Letter from DEQE to R&R Trucking, responding to R&R's request for opinion as to proper use of "clay and sandy clay being excavated from the MBTA Redline Extension tunnel construction project" and noting that "any soil exhibiting such low levels of contamination were excavated and stockpiled on site for future use as backfill on top of the completed tunnel" (CDD00101).

1. November 29, 1982 Letter from Cambridge Conservation Commission to MBTA, notifying MBTA that it was not complying with the DEQE's Superseding Order No. 123-20 with respect to cover of the backfill on the Russell Field Property (CCC03535).
2. January 17, 1983 City of Cambridge "Report on site visit to subway construction site at Alewife Brook by DEQE on January 13, 1983," which notes that the area of backfill at the Russell Field Property was observed as outside the area designated in the applicable Superseding Order of Conditions and "quite close to Jerry's Pond" (CCC02580-CCC02581).
3. April 25, 1983 Speed Letter from Perini to MBTA regarding "flooding and silting @ 508A" (CDD00151), stating as follows:

"J.P. White Const. Co. is presently flooding the complete 508A area. They are dewatering the Russell Field dumping site and are sending a silty water onto the job site. We cannot be held responsible for the silting build-up in the ducts and drains on the site."
4. April 26, 1983 MBTA Memo Routing Slip (CDD00152), stating as follows:

"The specs. for both contracts require the contractor to protect excavations from surface water. J.F. White has done nothing to prevent the surface water from Russell Field from entering the Tunnel."
5. June 14, 1983 Letter from the DEQE to the Somerville Health Department, enclosing a "Memorandum of the Record," regarding complaints of odors associated with the soils being staged at the Russell Field Property and used as backfill (CDD00296-298). The author of the Memorandum stated that he examined the stockpile and noted that he could not get closer than 100 feet "due to muddy conditions and danger of collapse of steep slopes which resulted from digging into the side of the stockpile." He also noted that there was a bulldozer in operation and loading trucks.
6. July 15, 1983 Memorandum from Cambridge Conservation Commission regarding "Description of the Conservation Commission's involvement with the W.R. Grace site and Russell Field" (CCC00666-CCC00668), noting noncompliance with the Superseding Order of Conditions.
7. Photographs taken during the period that the Russell Field Property was being operated by the MBTA and its contractors (attached as Exhibit B to this package

of materials).

On information and belief, the MBTA also stockpiled significantly more soils than it had anticipated or that it could properly manage or utilize as backfill over the completed tunnel. See, for example, the following:

1. May 10, 1982 Memorandum from the MBTA to "Resident Engineers," stating that "we have presently exceeded our contract requirements for stockpiling acceptable fill at Russell Field to be used as backfill on all Red Line -North contracts" and requesting estimated stockpiling needs (CDD00206).
2. September 27, 1983 Letter from the MBTA to the Cambridge Conservation Commission (CCC00108-CCC00116), stating as follows:

"Of the disturbed soils containing naphthalene, a portion has been used as backfill for the Red Line Tunnel and a portion is stockpiled at Russell Field."

"Of the portion used as backfill, a small amount has been placed in the Alewife area and approximately 6,000 cubic yards have been placed on the tunnel west of Davis Square."

"The ultimate location of the remaining soil, which is approximately 20,000 cubic yards, is under review."

On information and belief, the excavation, transportation, handling, stockpiling, storing, moving and other operations of the MBTA, Sverdrup, Perini, JF White, and White/Morrison/Mergentime at and in the vicinity of the Russell Field Property resulted in the release of oil and hazardous materials at the Russell Field Property.

V. RESTORATION OF RUSSELL FIELD BY THE MBTA AND ITS CONTRACTORS

It appears that during the period that the MBTA and its contractors were evaluating what to do with the excess excavated soils that it had stockpiled on the Russell Field Property, they were also designing the restoration of the Russell Field Property. The original Superseding Order of Conditions issued by the Massachusetts DEQE in 1980 required the MBTA to restore the Russell Field Property "to the ground elevation existing at the time of filing of the notice of intent" (CCC02476-CCC02479). In addition, the above-referenced 1978 Agreement between the MBTA and the City of Cambridge required the MBTA to cover the Russell Field Property with the same amount of loam as then existed. MBTA hired Sverdrup to assist it in designing the restoration of the Russell Field Property and Modern Continental to implement the restoration activities.

Rather than restore the Russell Field Property to its original elevation, however, the MBTA requested and obtained an Amendment to the DEQE's Superseding Order of Conditions allowing it to raise the elevation of the Russell Field Property by approximately five feet. In requesting the amendment, the MBTA asserted that raising the elevation would allow it to construct a gravity-based storm drain system rather than one requiring active pumps (see, e.g., communications related to MBTA's requested Amendment at DEP01585-DEP01590, CDD00303, CDD02725-CDD02739, CCC02532-CCC02536, and CCC02543).

In a letter dated May 21, 1985 to the MBTA, the City outlined certain steps that the MBTA and its contractors were required to take to satisfy the terms of their prior Agreement related to the restoration of the Russell Field Property. Among other things, the City noted that, particularly in light of the MBTA's plans to raise the elevation of the Russell Field Property, the work must "include toxicity tests of all material used by the MBTA to raise the field elevations" (CDD02337-CDD02339). In a July 18, 1985 response to that letter, the MBTA stated that if "any further material" is moved onto the site for the purpose of bringing the field to grade and its source "is of a questionable nature," such materials would be tested. The MBTA noted further that "[t]he material that is presently there has been tested several times and any further testing is, in my view, a waste of time, money and effort: All previous test results will of course be made available to the City" (CDD00310-CDD00311).

On information and belief, the MBTA and its contractors utilized some or all of the excess backfill material that it had excavated from the W.R. Grace property and staged on the Russell Field Property as fill to raise the elevation of the Russell Field Property. In addition, the City believes that the previous test results of the staged soils were never provided to it by the MBTA or its contractors, either before or after the above-referenced July 18, 1985 letter from the MBTA. Nor has the City to its knowledge ever been provided with information confirming the source of the materials utilized by the MBTA and its contractors to raise the elevation of the Russell Field Property (see, e.g., February 28, 1996 letter from the City to the MBTA at CDD00289-CDD00290, indicating that such information had never been provided to it). Recent investigations on behalf of the City have confirmed that elevated levels of oil and hazardous materials are present in the fill material brought onto the Russell Field Property by the MBTA and its contractors, including among others asbestos, PAHs, metals and naphthalene.

In addition, during the restoration of the Russell Field Property, the MBTA and its contractors realized that they had improperly capped sewer lines in the northeast corner of the Russell Field Property causing seepage to collect in that area. The error was purportedly corrected as part of the restoration activities (see July 24, 1986 Letter from Modern Continental to the MBTA at DEP01578-DEP01580). However, it is significant that this area of the Russell Field Property appears to correlate with a "hot spot" of contamination as depicted in the figures attached as Exhibit F to this package of materials.

On information and belief, the above-referenced restoration activities of the MBTA,

Sverdrup, and Modern Continental resulted in the release of oil and hazardous materials at the Russell Field Property.

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